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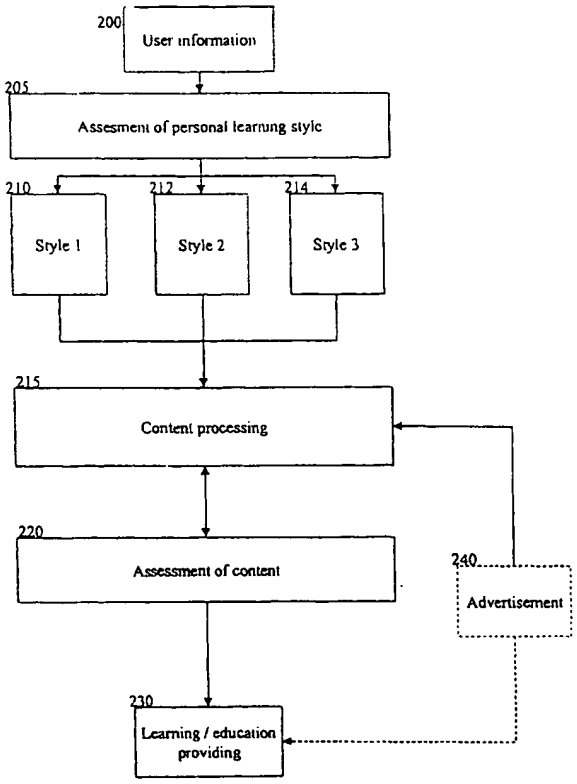
(54) Title: METHOD AND SYSTEM CUSTOMIZING INFORMATION REPRESENTATION DEPENDING ON THE USER'S LEARNING STYLE AND ABILITIES



(57) Abstract: A system for understanding, education and demonstration provides a way of customizing the content and user interface and functions for a user to manage and process the content based on the ascertained learning style of the user. The content may be organized at a server or at a terminal, such as a fixed or mobile terminal, and may be presented to the user via a network such as the Internet.

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A. CLASSIFICATION OF SUBJECT MATTER
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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 008 975 A (MARSHALL WEINGARDEN) 14 June 2000 (2000-06-14) abstract column 2, line 40 - line 55 column 4, line 36 - line 46 column 5, line 25 - line 35 column 9 -column 11 --- -/--	1-8, 17-23

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	BODENDORF F ET AL: "Hypermedia navigation support by fuzzy logic and neural networks" INTELLIGENT PROCESSING SYSTEMS, 1997. ICIPS '97. 1997 IEEE INTERNATIONAL CONFERENCE ON BEIJING, CHINA 28-31 OCT. 1997, NEW YORK, NY, USA,IEEE, US, 28 October 1997 (1997-10-28), pages 180-184, XP010276348 ISBN: 0-7803-4253-4 page 181, left-hand column, paragraphs 3,4 page 182, left-hand column, paragraph 3 -right-hand column page 183	1-8, 17-23
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A	WHEELER R: "Introducing CATBrowser and Child Aware Technology at Starlab" , November 1999 (1999-11), pages 1-7, XP002165769 page 1 -page 5	1-28
A	STEPHANIDIS C ET AL: "Self-Adapting Web-based Systems: Towards Universal Accessibility" , 19 October 1998 (1998-10-19), XP002165771 the whole document	1-28
A	LANGER K ET AL: "A system architecture for flexible, knowledge-based, multimedia CBT-applications" MULTI-MEDIA ENGINEERING EDUCATION PROCEEDINGS, 1994., IEEE FIRST INTERNATIONAL CONFERENCE ON MELBOURNE, VIC., AUSTRALIA 6-8 JULY 1994, NEW YORK, NY, USA,IEEE, 6 July 1994 (1994-07-06), pages 20-29, XP010131692 ISBN: 0-7803-1963-X page 20, paragraph SUMMARY page 22, left-hand column page 27 -page 28	9-16, 24-28

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		EP 1008975 A2	14-06-2000
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		WO 0008556 A1	17-02-2000

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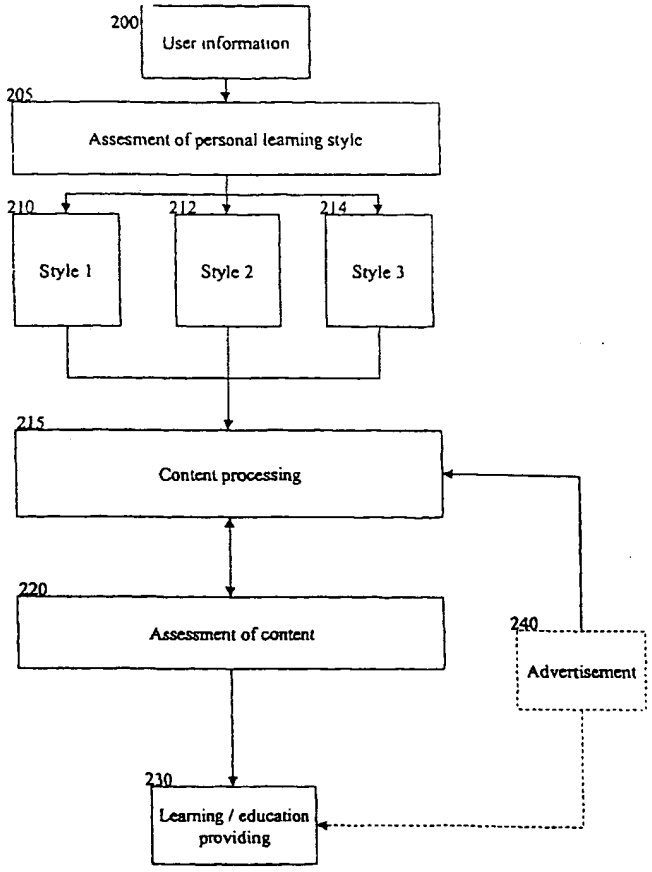
(54) Title: LEARNING STYLE DEPENDENT CONTENT AND SERVICE PROVIDING



(57) Abstract: A system for understanding, education and demonstration provides a way of customizing the content and user interface and functions for a user to manage and process the content based on the ascertained learning style of the user. The content may be organized at a server or at a terminal, such as a fixed or mobile terminal, and may be presented to the user via a network such as the Internet.

WO 02/29760 A2

Learning Style Dependent Content and Service Providing

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to the customization of a system for understanding, education and demonstration according to a user's abilities. This includes, but is not restricted to, the customization of the content, a user interface, and functions to the user for managing and processing the content.

2. Description of the Related Art

Different people learn and understand in different ways. For example, some people may learn best using a logical, procedural, linear thought process; others may prefer a holistic creative, spatial process. Some may learn best by studying the big picture first and by then studying the fine details; others may best learn by studying the details first and by then studying how the details they have already learned fit into that big picture. The particular approach to learning that works most effectively for a particular person may be termed the person's "learning style" or "way of learning". This invention uses the term "learning style" in a broader sense which also encompasses cognitive style and personality style. Cognitive style refers to the preferred way an individual processes information (see http://tip.psychology.org/styles.htm), and personality style to his psychological type (see http://www.aptcentral.org/main.cfm?fm=type).

Programs are commercially available to determine a profile of a person's learning habit or style with the goal of harnessing the ideal learning way

to best teach a user. One of these programs is Course Insite™ distributed by Avatar Technologies of USA. Information about Course Insite™ is available at the URL http://www.courseinsite.com.

The existing programs have several disadvantages. For example, the programs are not capable of providing or offering management of a comprehensive learning system. As another example, the programs are only able to test the learning style of the user. The programs may have limited versatility, for example, because they do not utilize effectively a user's personal learning style, and the programs are not able to create learning material accordingly. Thus, the programs do not provide content which is customized to the learning style of the user in order to achieve good and effective learning. These systems also have a disadvantage of a limited implementation platform that is only for single computers or a computer operating under a limited network solution.

SUMMARY OF THE INVENTION

It is an object of the present invention to utilize a user's learning style to take input and to process and output the content to the user in a way that is customized to the learning style of the user and also in a way where the user's constant guidance may not be required.

The present invention provides a system and a method for providing learning material to a user, such as a student of any organization. The user's learning profile, which corresponds to the effective way the user learns the subject, may be acquired by presenting various questions to the user relating to the user's

personal abilities to learn. For example, questions may relate to the user's cultural background, how the user prefers to learn (the big picture versus detail information), and what learning input the user prefers (audio, speech, visual text, visual picture, video, etc.). The user may enter the information at a terminal, which can be a wireless or mobile terminal or a fixed terminal connected directly to the Internet. After the profile may be acquired, a server may generate the profile and the user may review the profile and modify it to better fit the effective learning style of the user.

The system according to the invention can have various contents relating to different subjects stored on the server or the contents are available by network connections to the server. After the profile is ready, the system may begin to create an effective learning content according to the learning profile of the user. The effective learning content may include fragments of existing contents and/or it may have a series of different contents in an order which all are found to fit the user's learning style. It may even be that an already existing content fits the user's learning style well. After the content is created, the user can review the learning material, assess the content and provide feedback to the system in order to change the content or the user can directly change the content. After the assessment is finished, the user may review the learning presentation comprising the content to learn the subject matter in question.

The user interface which the user interfaces with the system can also be customized to the user's learning style. The customization includes customized icons and functions, and a customized output format.

Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is understood, however, that the drawings and the description are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 depicts a block diagram of a network arrangement which may be used to practice the embodiment of the invention;

FIG. 2 depicts a block diagram of a terminal which may be used to practice the embodiment of the invention;

FIG. 3 depicts a block diagram of a server which may be used to practice the embodiment of the invention;

FIG. 4 is a flow chart of a method for a learning style dependent content providing system;

FIG. 5 is a flow chart of a method for providing different content in a selected order depending on a user's learning style; and

FIGS. 6A and 6B show examples of a view of a user interface on a display of the terminal when using the learning style dependent content provided according to the embodiment of the invention.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

Referring to FIG. 1, a system for understanding, education and demonstration (these terms are used interchangeably) according to the present

invention enables the user to understand any subject. The system comprises profiling and content providing software, which may be termed "learning software", loaded onto a Web server 100. A user communicates with Web server 100 over the Internet 110 using a data communication terminal. This terminal may be a mobile terminal 130, such as a mobile telephone that can be compatible with the Wireless Application Protocol (WAP) or another wireless protocol, such as a mobile telephone (IP) using the Internet Protocol. (Where a WAP-compatible mobile telephone is used, the WAP Client may be a platform-independent implementation of a WAP client comprising the browser (for example, microbrowser) and the protocol layer. It may be targeted to device manufacturers that want to include WAP connectivity in their products. The WAP Client may be fully compliant and adaptable to different hardware and software environments.) The mobile terminal 130 may alternatively be a GPRS terminal (General Packet Radio Service), a UMTS terminal (Universal Mobile Telecommunications System), a wireless local area network (WLAN) terminal, a Bluetooth terminal, a wireless portable computer, a personal digital assistant (PDA), or another terminal that wirelessly links to a mobile network 140 over a wireless link 150. The terminal may also be a fixed terminal 120, such as a personal computer having Internet access or a Web TV terminal.

The mobile network 140 may be any type of wireless communication network or combination of networks, including, but not limited to, GSM (Global Standard for Mobile / Groupe Speciale Mobile), GPRS, WLAN, Bluetooth, UMTS or 3G (Third generation of mobile communications), where 3G can be compatible with GSM, HSCSD (High Speed Circuit Switched Data), GPRS, WLAN,

Bluetooth, EDGE (Enhanced Data Rates for Global / GSM Evolution) and WCDMA (Wideband Code Division Multiple Access). Various other network systems can be supported in 3G, such as CDMA (Code Division Multiple Access), PDC (Personal Digital Communications), and CDMA2000. The mobile network 140 may also be a WLAN (Wireless Local Area Network). The transmission may also be broadcast via DAB (Digital Audio Broadcasting) or DVB (Digital Video Broadcasting).

The system is interactive such that Web server 100 may transmit content and other information, such as information for profiling a user's learning style, to one or both of the mobile or fixed terminals 120, 130 and feedback from the user may be sent from the terminals 120, 130 to the Web server 100. Using the system, substantive content may be presented to a user in a personalized learning style that is effective and well-suited to the user, such as a learning style for a student to use for studying.

An advertisement server 160 may be optionally connected to the Internet 110 to provide advertisements to be viewed on fixed terminal 120 or mobile terminal 130. The advertisement server 160 communicates with Web server 100. Web server 100 and advertisement server 160 functions may be consolidated on a joint server.

Referring to FIG. 2, the mobile terminal 130 has various components comprising at least one output 180 that allows, for example, the user to visually read information on a display (not shown). The output 180 may also provide voice or sound of the information through a loudspeaker (not shown), and it may also display multimedia information such as video on the display. The mobile terminal 130 also comprises a central processing unit (CPU) 185 to process the received information for

output and to process any inputted information, and one or more inputs 190 used to input the information into the terminal. Input 190 may be, for example, a numeric keypad, a keyboard, a software keyboard touch screen, a touch screen (which may be incorporated with the output 180), a mouse, a pointing device such as a pointing pen, etc. The mobile terminal 130 also comprises a network transceiver 197 that is used in communication with the mobile network 140, a memory 195 and a data storage 196. The data storage 196 can be, for example, a hard disk magnetic or optical storage unit, as well as a CD-ROM drive or a flash memory. The data storage 196 can also be used to store and retrieve the content, especially if the mobile terminal 130 is capable of processing and storing large amounts of data. The mobile terminal 130 can also have any tool, such as software, to create the related education functions, as will be described later with reference to FIGS. 6A and 6B. Whichever terminal is used, whether the mobile terminal 130 or fixed terminal 120, that terminal must, for purposes of this invention, be capable of data communications, processing and storing data, and possibly handling multimedia outputs of the user interface, as described below.

Referring to FIG. 3, the Web server 100 also comprises components to be used for practicing the invention. Web server 100 comprises a content providing program tool 101 that is used in creating and processing the content or series of contents as will be described later in process steps in FIGS. 4 and 5, a document database 102 that has the information, such as document information, from which the learning material can be created, a user ID register 103 that is used to identify and authorize users and accordingly store user profiles to be used in content providing, a profiling program

tool 104 comprising software to profile the user according to the existing and entered information about the user, and a communication means 105 that is used in communication with the network, for example, the Internet 110 or the mobile network 140. The profiling program tool 104 can be software that utilizes functions to set a learning style of the user to a certain existing learning style which is the most correct one.

FIG. 4 shows the method for determining the manner in which content is selected, organized, and presented to a user, such as a student. At step 200, a user enters information to be used to ascertain the user's effective learning style at the terminal. The obtained information supplied by the user is transferred into the profiling program tool 104 in FIG. 3 that determines the user's learning style based on the user-supplied information. One way in which the effective learning way may be ascertained is by posing appropriate questions to the user, possibly using an interactive program, for example, profiling program tool 104 that is loaded on Web server 100 or in any other manner, and assessing the user's reply, for example, assessing answers the user gives. Various criteria that may help to ascertain the user's learning style include analysis of the user's culture, the order in which the user prefers to learn (the big picture versus the fine details), whether the user prefers a logical thought process, etc. The profiling program tool 104 in FIG. 3 can have a set of predefined distinct learning styles. Based on the information provided by the user, a user is profiled by the profiling program tool 104 as having a learning style in conformance with one of these profiles based on the user's responses. After the profiling program tool 104 has created the learning model of the

user, the user may review the learning profile and possibly make changes to the profile (step 205). After the user has checked the learning profile, the user accepts it and it is sent to the Web server 100 (step 205). The profiling program tool 104 may offer two or more appropriate learning styles to the user from which the user may select a learning style he or she prefers.

In the illustrated example of FIG. 4 there are three learning styles. Of course, there can be numerous different learning styles but, for illustrative purposes, three are shown. Styles 1 - 3 are represented by respective blocks 210, 212, 214. The content providing program tool 101 analyzes and processes the information provided by the user, according to the learning style of the user that the profiling program tool 104 selected (step 215). For illustrative purposes, assume that Style 1 (210) best matches the learning style of the user. The content providing program tool 101 respectively creates the learning content or learning material according to Style 1 (step 215). If Style 2 (212) was the best match for the user's learning style, the content providing program tool 101 would have generated the content according to the learning style of Style 2. After the content is created, the content or series of contents are transmitted to the user at wireless terminal 130 or at fixed terminal 120. The user may now review the learning material and assess the results (step 220). If the user wants to make some changes to the material, the user sends a reply to the Web server 100. The reply may, for example, be that the user wants to add an extra function to the material such as a text translator or that the user wants more audio output. Thus, the reply can be any kind of indication illustrating the alteration the user wants to make to

the material. It may be made directly to the material, for example, by an editor or it may be an indirect instruction to the Web server 100 to make the change accordingly. The selected learning style is used to organize and provide a learning content to the user (step 230).

Referring to FIG. 5, the content available to be incorporated into the presentation is stored as pre-existing units or contents in a database either locally or on Web server 100, or split between those multiple (local or server) storage media with the interface between the multiple media being essentially invisible (steps 250, 252, 254). Where the content is stored will ultimately be influenced by how and where it is least expensive, easiest, or fastest to utilize the invention and to store the information. These units or fragments are organized in a manner that depends on the learning style of the user, rather than being stored and presented in a predetermined order, which is the normal order available for presenting this information (step 260). Step 270 illustrates a content that is a combination of content 1 and 2, which is created by process 260 by the content providing program tool 101. Step 280 illustrates learning material content 3 which is delivered to the user before the combined material 1 and 2. This is because the system has found that the user learns effectively according to the order of the content where the material 3 is first and the combination of materials 1 and 2 follows. The content providing program tool 101 may also determine the level at which the material is taught, for example, beginner, intermediate, advanced, etc. The user may be given the option of rearranging the order of materials as determined by the content providing program tool 101.

The user's profile can be stored in a database such as the user ID (identifier) register 103 in FIG. 3 or along with the processed content information for future use. The learning content is provided to the user at step 230.

The system may also specify the media format of the output, which is a certain output or combination of different output ways (visual text, picture, speech, audio, video, etc.) that follows the learning style of the user. For example, it may be determined that a user learns effectively where the output is according to a "Style A" having 40% visual text output, 20% visual picture output, 20% speech output, 10% audio output, and 10% video output. For another example "Style B" where the output may be comprised of media in different percentages, such as 20% visual, 30% interactive, (i.e., a communication between a source of the information, such as a teacher, and a user), and 50% audio. The content providing program tool 101 in FIG. 3 generates the sharing of the media. The user interface is adapted to perform and manage these preferred learning outputs best for each student based on the selected profile.

Advertisement information provided by the optional advertisement server 160 may also be added to the learning materials and be incorporated into the content presented to the user or displayed alongside the displayed content. Advertising fees are paid by the advertiser, for example, to the creator of the content, to the service provider, or to the profiling program provider to pay for and/or supplement the user's payment for the materials, such as study material, possibly to allow the student to be charged a reduced fee. The advertisement fee charged to the advertiser may be based upon the length of time the advertisement is displayed

and/or the display size of the advertisement relative to the size of the data frame for the content streamed to the display. Because the system uses personal information about the user it may be possible to customize the advertisement too. The customized advertisement may be according to the learning profile of the user, for example if the user is profiled to learn effectively by hearing an audio information, speech, the advertisement may be a short audio information about some product. In addition to advertisements, other extra information can be added to the processed content, such as music, background, speech, audio, video, picture, etc. to create a full multimedia experience that may help the studying by providing more entertainment and may also be enjoyable.

The user who receives the processed content can evaluate the presentation and provide feedback about the material itself and the way in which the material was processed and sent or possibly broadcast. Thus, users can view the predetermined subject matter in the predetermined way, with optional extra information to present the study material in an individualized environment in which each user likes to study.

Apart from the customized learning-style dependent content that may be provided, each of the available profiles may have associated them with a suitable user interface. The user interface may include a set of functional symbols commonly known as "icons" that represent a predetermined effective learning symbol for a specific function in the learning user interface. These symbols are created based on the analyzed and personal learning profile or they can be created based on an existing standard models.

Referring to FIGS. 6A and 6B, an example of a user interface 600 is illustrated in FIG. 6A and another example of the user interface 620 in illustrated in FIG. 6B. The user may conduct financial transactions over the Internet utilizing the interface, such as buying more learning material or selling previously purchased or user-created materials. An appropriate symbol that may be incorporated into the interface for invoking one of the financial transactions in one or more profiles may be a "purse" 602. Likewise, a graphical icon having an illustration of a "backpack" (also commonly referred to as a "knapsack" or "rucksack") 604 may provide means for the user to control his or her material stored locally at fixed terminal 120, at mobile terminal 130 in memory 195 or in data storage 196, or on Web server 100. A similar icon illustrating an "eye" 606 can represent a command for either fixed terminal 120 or mobile terminal 130 to read a menu of commands aloud to the user. An icon having an illustration of an "ear" 606 can be used to invoke a command to listen for a user's spoken command into input 190. Other symbols representing other functions, which may be referred to as "symbol-function pairs" are possible. Another user interface 620 has "symbol-function pairs" including a "purse" 622, a "backpack" 624, an "eye" 626, and an "ear" 628. This interface 620 has also been determined by the system to have a suitable and preferred interface for the user in question and for the learning material that is provided to the user according to the learning style of the user.

The functions available with the user interface provided for that profile may also be customized to the user's profile and the user interface is adapted to perform and manage these preferred functions that are suitable for learning. The customized

functions may be, for example, providing electronics dictionaries, calculators, textbooks and other reference books, or management of materials the user has prepared, including class or lecture notes, outlines, or mindmaps, which are pictorial illustrations of information that might be placed in a list and in the interrelationship of the information, such as the interrelationship of various topics, concepts, or persons. Referring to FIGS. 6A and 6B, for example, a learning screen for mathematics may be the interface screen 600 including a calculator 610, whereas a screen to teach languages may be the interface screen 620 and include a dictionary which is accessed with the symbol 630. Or a screen for reading an electronic book in a foreign language may offer a text translator. The functions may also include, for example, text translators for translating a word, clause, chapter or any other portion of text that the user marks or otherwise selects, a function for pronouncing words, and a function for creating a mindmap based on the user's underlining or marking of text or other content. The user interface can also have a connection and interface to a bookstore or library, and/or functions to implement games.

Thus, while there have shown and described and pointed out fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same result

are within the scope of the invention. Moreover, it should be recognized that structures and/or elements and/or methods steps shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice.

CLAIMS

What is claimed is:

1. A method for providing a content to a user at a terminal in a communications system, the presentation of the content being dependent on abilities of said user, the method comprising:

ascertaining said abilities of said user using a profiling tool at a server and information obtained from said user;

selecting said content from at least one existing content;

organizing said content into a customized presentation using the ascertained abilities of said user; and

presenting the customized presentation to said user.

2. The method of claim 1, wherein the step of organizing said content is performed at said server.

3. The method of claim 1, wherein the step of organizing said content is performed at said terminal.

4. The method of claim 1, wherein the step of ascertaining said abilities of said user comprises:

obtaining the information from said user;

comparing the information obtained from said user to a predetermined criteria for multiple learning styles at said server; and

selecting a learning style of said user from the multiple learning styles at said server.

5. The method of claim 1, wherein the presentation is presented to said user via the Internet.

6. The method of claim 1, wherein the presentation is presented to said user via a network, such as a mobile network.

7. The method of claim 1, wherein said terminal includes a mobile terminal.

8. The method of claim 1, further comprising adding additional information to said content.

9. A method for customizing a user interface of an educational or demonstration system for a user at a terminal depending on abilities of said user, comprising:

ascertaining said abilities of said user using a profiling tool and an information obtained from said user;

customizing the user interface to the ascertained abilities of said user at said terminal; and

presenting the customized user interface to said user at said terminal.

10. The method of claim 9, wherein the customization of the user interface comprises creating a customized icon.

11. The method of claim 9, wherein the customization of the user interface comprises customizing available functions to control the system.

12. The method of claim 9, wherein the customization of the user interface comprises customizing an output format of the presentation to comprise at least one of audio, speech, visual text, visual picture, and video.

13. The method of claim 9, wherein the step of ascertaining said abilities of said user comprise:

obtaining information from the user;

comparing the information obtained from the user to a predetermined criteria for multiple learning styles at a server; and

selecting the learning style of said user from the multiple learning styles at the server.

14. The method of claim 9, wherein the presentation is presented to said user via the Internet.

15. The method of claim 9, wherein the presentation is presented to said user via a network.

16. The method of claim 9, wherein the terminal includes a mobile terminal.

17. A system of providing a content to a user at a terminal in a communications system depending on abilities of said user, comprising:

means for ascertaining a learning style of said user;

a database including the content for presentation to said user;

means for organizing the content into a customized presentation using the ascertained learning style of said user; and

means for presenting the customized presentation to said user.

18. The system of claim 17, wherein the means for ascertaining said learning style of said user comprises means for ascertaining said learning style of said user at a server.

19. The system of claim 17, wherein the means for organizing said content comprises means for organizing said content at a server.

20. The system of claim 17, wherein the means for organizing said content comprises means for organizing said content at said terminal.

21. The system of claim 17, wherein the means for presenting comprises a network and the Internet to transfer the presentation to the user terminal and means for outputting the presentation in a format comprising at least one of audio, speech, visual text, visual picture, and video.

22. The system of claim 17, wherein said terminal includes a mobile terminal.

23. The system of claim 17, further comprising means for adding additional information other than for educational purposes to the customized presentation.

24. A system for customizing a user interface of an educational or demonstration system for a user at a terminal depending on abilities of said user, comprising:

means for profiling a learning style of said user;

means for customizing the user interface to the ascertained learning style of said user; and

an output at the terminal to present the customized user interface.

25. The system of claim 24, wherein the user interface comprises a customized icon.

26. The system of claim 24, wherein the user interface comprises a set of functions that are available to the user to control the system.

27. The system of claim 24, wherein the output presents an education information in a format inluding at least one of audio, speech, visual text, visual picture, and video.

28. The system of claim 24, wherein said terminal comprises a mobile terminal.

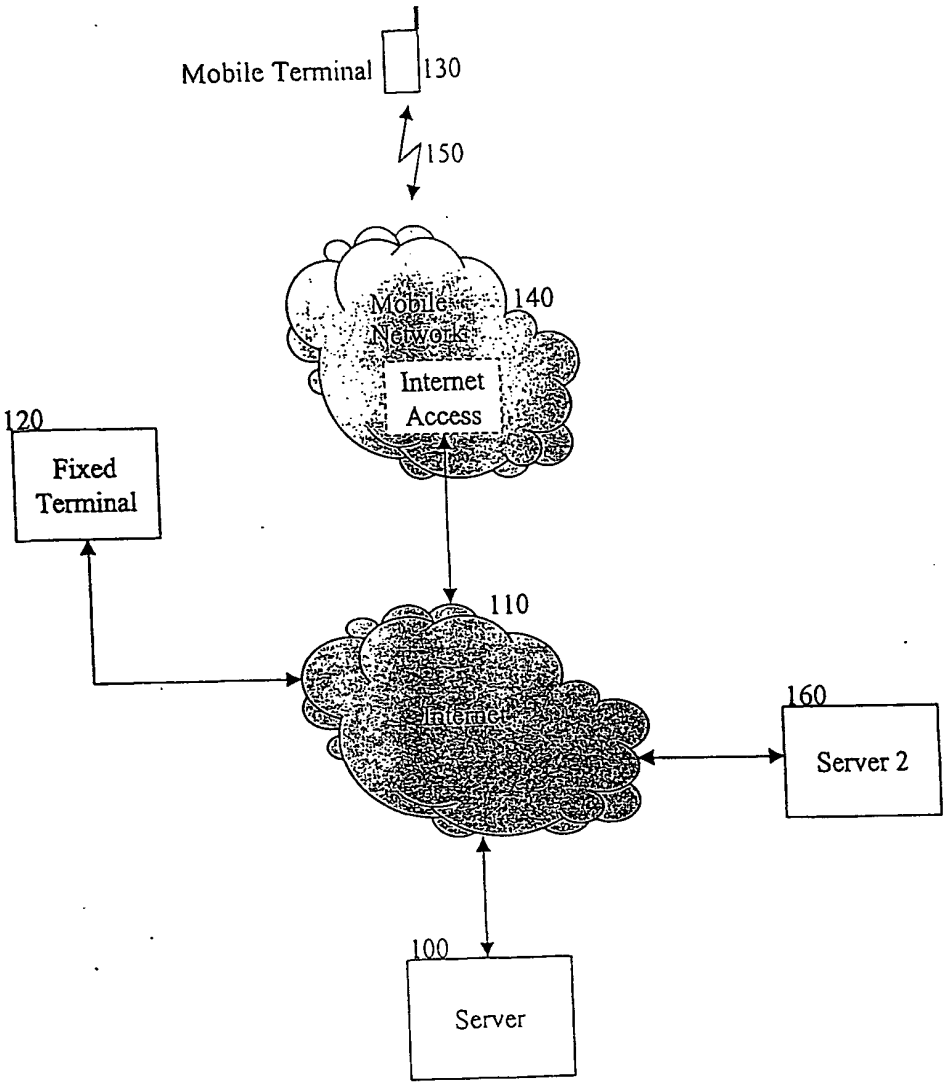

Mobile Terminal
130
150
Mobile Network
140
Internet Access
120
Fixed Terminal
110
Internet
160
Server 2
100
Server

Fig. 1

Fig. 2

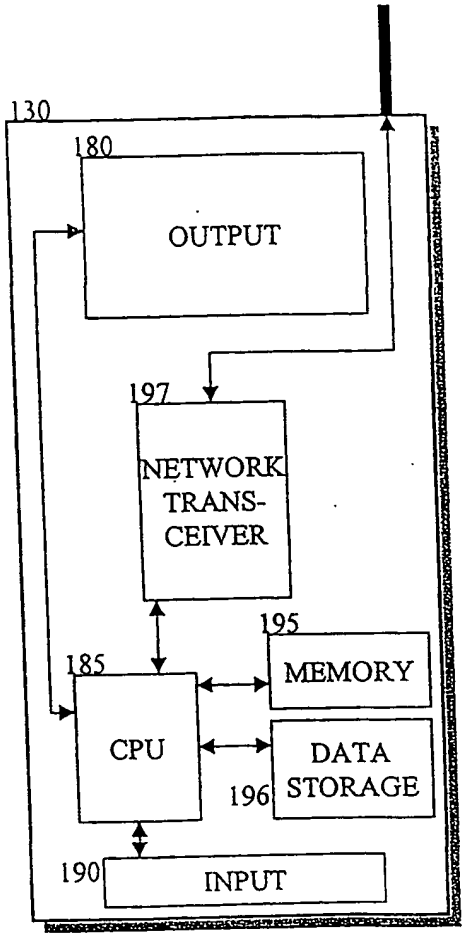

130
180
OUTPUT
197
NETWORK TRANS-CEIVER
195
MEMORY
185
CPU
DATA STORAGE
196
190
INPUT

Fig. 3

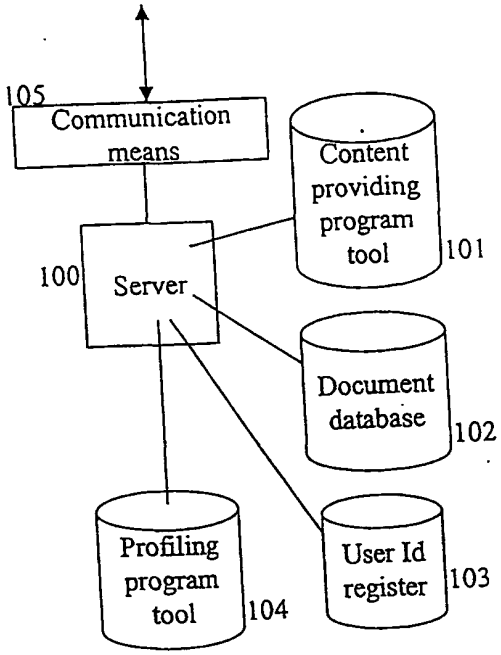

105
Communication means
Content providing program tool
101
100
Server
Document database
102
Profiling program tool
104
User Id register
103

Fig. 4

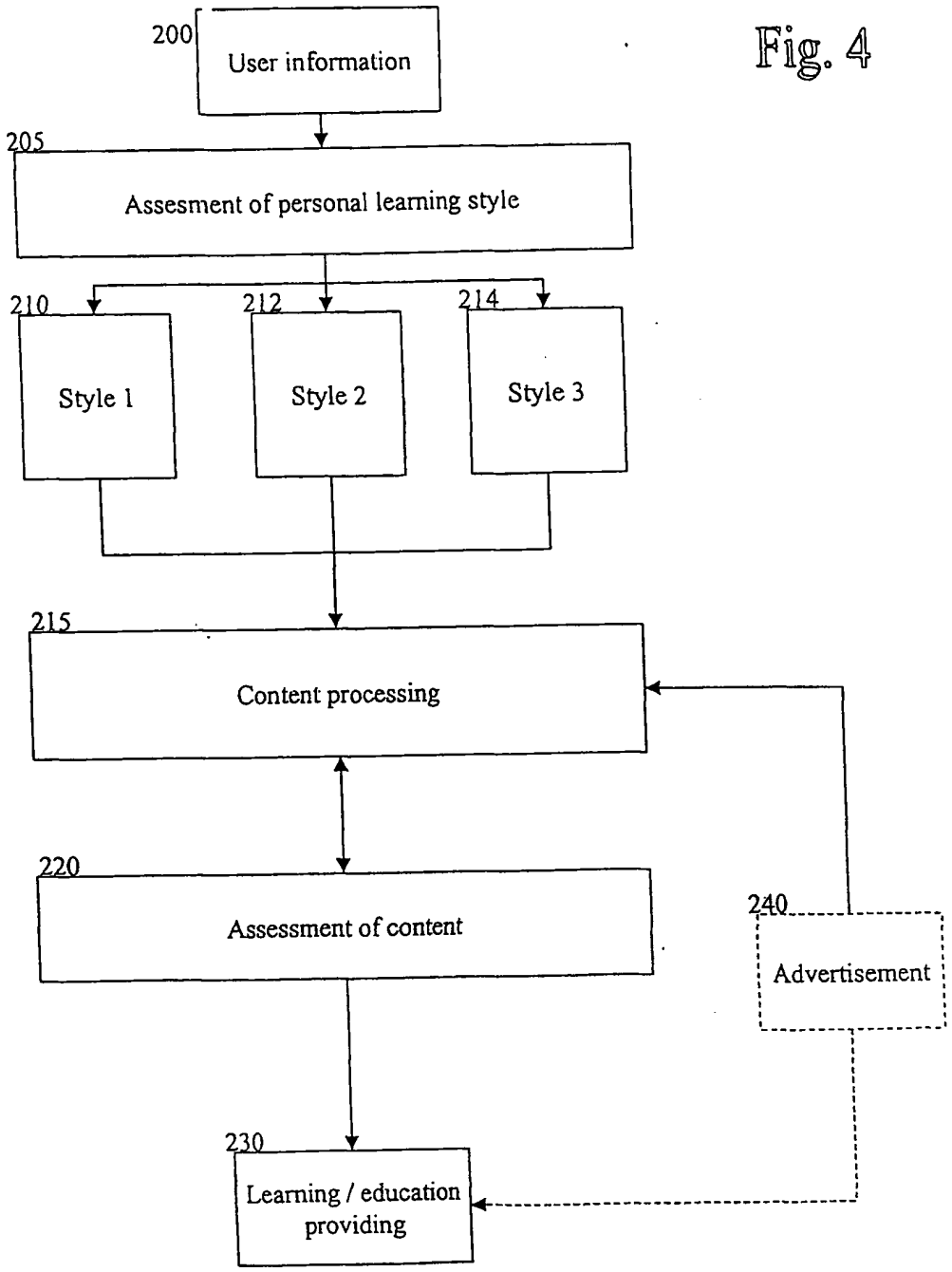

200
User information
205
Assesment of personal learning style
210
Style 1
212
Style 2
214
Style 3
215
Content processing
220
Assessment of content
240
Advertisement
230
Learning / education providing

Fig. 5

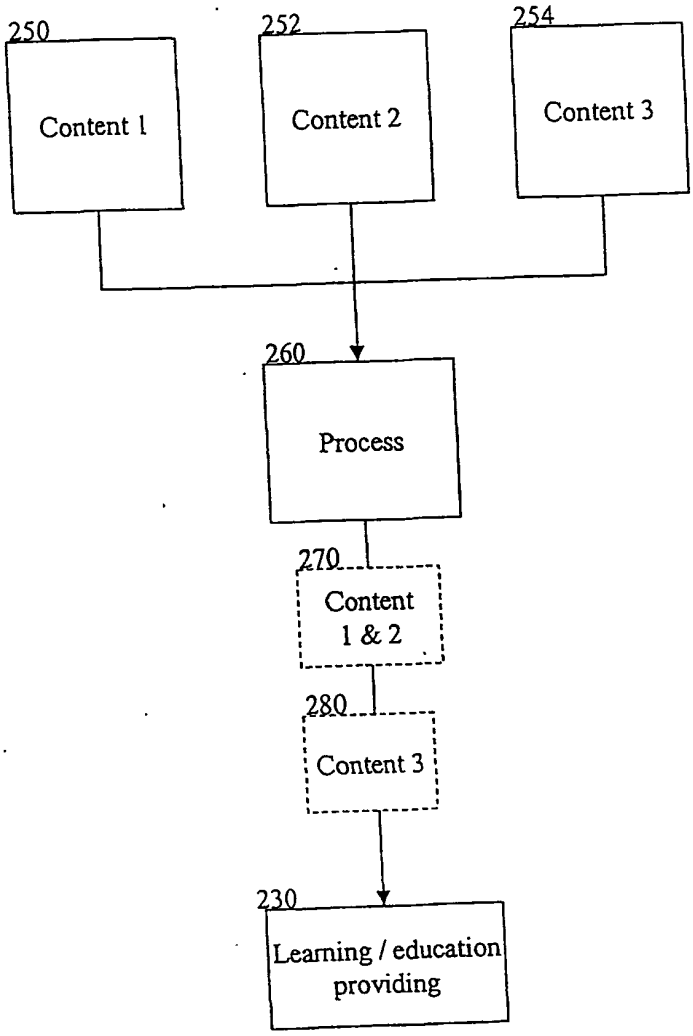

250
Content 1
252
Content 2
254
Content 3
260
Process
270
Content 1 & 2
280
Content 3
230
Learning / education providing

Fig. 6A

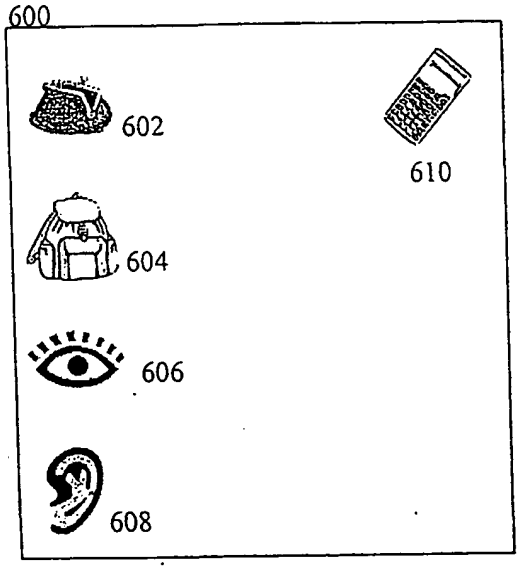
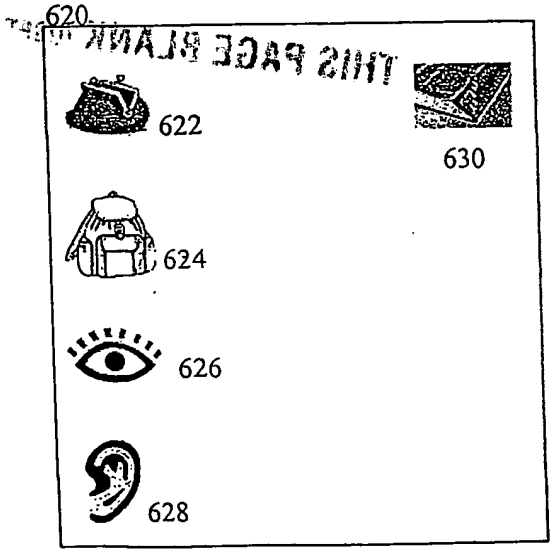


Fig. 6B



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